



Department of Economics and Finance

Impact of Debt-Bias in the Context of CCCTB on SMEs

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1. Introduction

1.1 Theoretical background

The financial crisis of 2008 has showed that many companies were highly leveraged and that a low level of corporate equity increased the propensity to bankruptcy. The asymmetric taxation system on equity and debt is seen by the European commission as the main reason of a low equity level. Indeed, authorities have different tax policy regarding interest payments and dividends. Legal authorities generally allow companies to deduct debt payments from the taxable income tax base but do not allow any deductible notional interest on the return of equity. This difference of treatment between debt and equity tax deduction incentivizes companies to rely excessively on debt (de Mooij, 2011). This distortion is referred as the debt-bias. Several issues have been highlighted with debt-bias¹. Firstly, companies facing a debt-bias tend to rely too much on debt to finance themselves, causing them to be too highly leveraged. Concerns from the financial crisis of 2007 has highlighted weaknesses in the financial health of highly leveraged companies. Their financing decision causes them to be more sensitive to economic fluctuations. The difference of tax deduction between debt and equity also affect SMEs and young firms. Those firms usually face comparative disadvantage compared to larger companies regarding their financing options. It is indeed more arduous for them to access funds through debt, as the smaller firms are often seen as more financially robust and safer to invest in.

The debt-bias and its negative consequences have been heavily documented since the 1980s. A tax allowance on equity or on the increase of equity could help reduce this debt-bias. Ideally, policymakers should implement a perfectly neutral tax system to maximize total welfare and reduce misallocations of capital. The theoretical basis of this tax concepts was first developed by Boadway and Bruce (1983) who brought two major contributions to the literature, the definition of a neutral tax base regarding the companies' investment and financing decisions, and fiscal deductions for costs of capital, regardless of costs of equity or costs of debt. They suggested two methods to reach a neutral tax base. The first method is the "imputed income method", defining the income tax base as the pure profits of the firm. However, this method is seen as complex to implement, due to resources and the amount of information it requires to compute taxes to be paid. The second method consists of defining the income tax base as the two methods would achieve the same objectives, the latter method has the advantage of being much easier to implement. Indeed, cash flows must be publicly stated to authorities in the financial statements, when real production costs are not. The

¹ See Impact assessment CCCTB 2016

second contribution of the paper is about achieving a neutral fiscal deduction for costs of capital, regardless the source of capital, equity or debt. Indeed, the authors considered a tax system with allowances proportional to the weighted average of the costs of equity and debt. Devereux and Freeman (1984) have brought a major contribution to the literature by extending Boadway and Bruce (1983). They developed the concept of "Allowance for Corporate Equity", ACE, as an incentive for companies to rely more on equity funds than the current tax systems would usually suggest. The ACE consists of a new allowance proportional to the capital financed through equity multiplied by a nominal interest rate, usually the market risk-free interest rate.

Numerous papers support the idea of an ACE (Devereux and Freeman, 1991) (Devereux et al., 2002). Since the 1980s, capital has become increasingly mobile. To attract highly mobile capital, numerous countries have decreased their statutory interest rate, causing competition among countries. Tax competition is however harmful for public finances. To solve this issue, a compelling international reform of the tax system is necessary (Devereux and Vella, 2007).

Other strategies than an ACE can be implemented in order to confront profit shifting. For example, members of the OECD attempted to tackle profit shifting and tax planning at the international level with the "Base Erosion and Profit Shifting" initiative (BEPS). The BEPS initiative is a set of instruments aiming at tackling profit shifting and tax planning at the international level. Nonetheless, its effects will likely be limited due to the absence of any profound reform at the problems' roots (Devereux and Vella, 2014). Even if the OECD's BEPS appears to be poorly efficient while an ACE might on the contrary reform deeply the tax systems, the ACE policy would also have a limited impact if adopted by only few countries (Isaac, 1997). Devereux and Vella (2007) present the European approach with the CCCTB as the most adequate approach to tackle the profit shifting at the international level as explained in the following section.

The situation in the EU is unique due to its European Single Market. Capital has become more easily mobile and at a lower cost thanks to the liberalization of capital movements inside the EU borders². Because of the increase of tax competition between EU members and the absence of any significant EU regulation, multinational groups have largely performed profit shifting in reduce their tax burden. Since the financial crisis of 2007 and the sovereign debt crisis that followed, the European Commission urged in 2015 the restart of a European project for a "Common Consolidated Corporate Tax Base" (CCCTB). The CCCTB is a set of tax reforms

² See the Council Directive 88/361/EEC

aiming at profoundly restructuring the way EU members and companies interact. The aims of the CCCTB are numerous. The European Commission (EC) would like indeed to impose a fair tax burden to each economic player, individuals, SMEs and MNEs. The tax reforms considered by the EC would also allow to target a significant reduction of tax competition among EU countries. Furthermore, the CCCTB proposal aims at simplifying the current corporate income tax system through a harmonization of the computation of the taxable corporate income base among EU members. However, the objective of the CCCTB is not to harmonize the statutory corporate income tax rate within the EU. It is indeed a national responsibility established by the European treaties. With the implementation of the free movement of capital inside the EU, new problems have arisen and require a common European approach, e.g. the increase of intra-group transactions, more aggressive corporate tax plans, tax competitions among EU members to attract mobile capital, etc.

The CCCTB is expected to significantly impact the environment in which companies develop their business in the EU. This major reform is expected to stimulate the R&D private expenditures, facilitate the internationalization of companies inside the EU and reduce the debtbias. About debt more specifically, The European Commission considers several methods to reduce it, and backs up the idea for an "Allowance for Growth and Investment" (AGI). An AGI is often called soft-ACE, as it allows tax relief on additional capital invested in the company through equity. In comparison, a hard-ACE relies on the total book value of the firm's equity. Since a few countries in the EU have implemented a tax relief on capital in the 2000s and 2010s, a comparison and evaluation of their policies would be insightful.

1.2. ACE in Austria, Belgium and Italy

Massimi and Petroni (2012) analyse the different countries having at one time applied an ACE and differentiate them between soft-ACE and hard-ACE.

Four European countries have or had a soft-ACE: Austria, from 2000 to 2004, Italy between 1998 and 2003 and again since 2012, Latvia, from 2009 to 2014, and Portugal, from 2010 to 2013. Three countries applied a hard-ACE: Belgium, from 2006, but modified throughout the years, making it gradually closer to a soft-ACE, Croatia, from 1994 to 2000, and Liechtenstein, since 2011.

In this paper, a comparison between the Belgian, Austrian and Italian experiences with ACE for SMEs is made. To do so, let's briefly describe the specificities of the tax policy applied to each country.

1.2.1. Belgium

Belgium introduced a hard-ACE in 2006 with notional interests. Because it is a hard-ACE, the notional interests are computed on the book value of the whole equity of companies and no new investment is required to benefit from it. The idea behind this is that the value of equity decreases throughout the years. All companies, exempt few exceptions, are virtually impacted by the policy. In order to reduce the risk of abuses, the Belgian ACE considers a set of anti-avoidance rules. This system has been very controversial because seen as mainly favoring large MNEs compared to SMEs (Zangari 2014). Moreover, the increase of investment has been seen as largely insufficient compared to the policy's cost on the public budget. However, Princen (2012) highlights that both SMEs and MNEs both decrease their leverage thanks to the ACE by respectively 4,6% and 4,9%.

1.2.2. Austria

The Austrian government introduced a soft-ACE in 2000 called Allowance for Increase in Equity, AIE, and was expelled in 2004 for companies. During that time period, unlike the Belgian ACE, only the increase of the book value of equity was subject to notional interests. The study made by Petutschnig and Rünger (2017) shows that the AIE increased the equity ratio of Austrian companies by 5,5%. This percentage increase drops to 3,4% when a difference-in-difference is performed with Swedish companies. They also discovered that the impact of the tax reform decreases with the size of the companies.

1.2.3. Italy

The Italian authorities introduced a soft-ACE from 1998 to 2003 and reimplemented it in 2012. Because the reform is a soft-ACE, only the increase in equity is concerned by the notional interests. Empirical analyses of the Italian soft-ACE report an average leverage reduction of 4,2% in 1998 (Barnasconi, 2005) and 2,5% in 2012 (Panteghini, 2012).

The current paper mainly focuses on the Italian ACE and analyses its impact more specifically on SMEs.

1.3. What can SMEs expect from an ACE?

One of the conclusions from the European Commission report of 2016 is that an ACE at the European Union scale could be largely beneficial to all actors. One major drawback of the impact assessment from the European Commission is that it uses the CORTAX model. The CORTAX model is a state-of-the-art general equilibrium model used to assess the impact of variation in the corporate taxation environment. To do so, the model uses global data and

information issued from companies and corporations. However, the data available originates from large companies. The model is therefore currently unable to estimate the impact of the CCCTB reform, and then the AGI proposal, on SMEs. To fill this gap, the European Commission calls for further researches in order to assess the impact of its proposal on SMEs.

This paper aims at answering the call by empirically assessing the impact of the Italian ACE reimplemented since 2012 on specifically SMEs with a focus on debt-bias. A comparison is then made with the Austrian soft-ACE and the Belgian hard-ACE. Studying the data on Italian SMEs, and comparing with other countries provide new insights on the impact of the ACE and help to understand opportunities of an ACE at the European level on SMEs.

2. Methodology and variables

2.1. Data

Data on national small and medium-sized enterprises (SMEs) were collected from the AMADEUS database³ for Italy and Spain. Because the Italian ACE has been set up since 2012, the data collected concerns years from 2009 to 2014, the goal being to collect information 3 years prior and post policy implementation.

2.2. Variables

The 10 following variables were collected:

Company Name Country ISO code Company's Regional Location (NUTS3) Company's Industry NACE code, 4 digits Year Total Assets Profits/Losses Before Taxes Number of shareholders in 2014 Shareholders' Funds Turnover

Because of data availability, for each company, the number of shareholders in 2014 is supposed constant over the period 2009-2014. It is also assumed that the location of the SMEs doesn't change over that period.

Further adjustments have been done in order to make sure companies appear each year in the sample. One could argue that removing firms with missing data for years can slightly affect the

³ The Amadeus database is a data-collection software developed by Bureau van Dijk Electronic Publishing

sample. It is indeed probable that some companies go bankrupt within the time period of the sample. However, compared to the size of the cleaned sample, it is easily assumed that these dropped entries in the database have an insignificant influence on the measure of the effect of the Italian ACE.

Company name

The name of the company is useful to identify it and to attribute it an individual ID. However, some companies have the same name in the AMADEUS database. In order to give a different ID for companies of the same name, the ID has been attributed depending on the company's name and its location. In the extreme case of two companies with the same name and in the same geographic location, these companies have been dropped off the sample. Indeed, the two companies would get the same ID, and would appear more than six times even though six-year periods are considered (2009-2014).

Country ISO code

The country ISO code helps identify the country where the company is located. This variable is essential to be able to perform a difference-in-difference analysis of Italy and Spain, as it will be explained in the methodology. The value of the variable can either be "IT" for Italy or "ES" for Spain.

Company's Regional Location (NUTS3)

The NUTS3 is a 5-digits variable corresponding to unique provinces in which companies are located. The structure of the NUTS3 allows to easily generate the code for NUTS2 to obtain the regions of companies' location. The NUTS1 code is used to identify groups of Italian regions. This variable will allow to perform a geographic analysis of the impact of the Italian ACE.

	NUTS1	NUTS2	NUTS3
NUTS nomenclature	ITE	ITE4	ITE43
Corresponding entity	Central Italy	Lazio	Rome

Company's Industry NACE code, 4 digits

The NACE code 4 digits helps identify the companies' industry. This will allow to compare and highlight sectors that would have more benefitted from the ACE reform. Companies included in sector of activities such as education, administration and the financial sector have been removed of the study.

Year

The year corresponds to the year for which data has been collected.

Number of shareholders

This variable corresponds to the number of individuals having invested funds in the company as equity. As mentioned earlier, the number of shareholders could only be collected for the latest year of the sample, 2014. This constrain implies assuming the number of shareholders didn't vary between 2009 and 2014. Nonetheless, this assumption should not have a significant impact on the analysis of the results.

Total Assets

Total assets represent all the assets owned by the company in year t. Due to the presence of very large outliers, adjustments will be performed. Outliers were eliminated from the database by limiting the selection of companies with total assets up to $3.000.000 \in$. Above such limit, the company was no longer considered as a SME.

Shareholders' Funds

"Shareholders' funds" corresponds to the value of shareholders' investment. Shareholders' funds is also known as shareholder equity which originates from cash from the investors when stock is sold by the company, and the retained earnings.

A minimum fund of 25.000 EUR was applied on the data base to eliminate companies with tiny activities or in insolvency.

Turnover

The turnover of a company corresponds to the volume of sales that occurred during the fiscal year. Only SMEs with a turnover between 0 and 4 million EUR are kept. SMEs turnovers face also outliers. For example, a company in the sample is reported having performed a turnover superior to 450 million EUR. With a turnover that high, it is dubious to still consider it as a SME. On the other hand, some companies are reported having negative turnovers, which is not realistic. It is why a limitation of the turnover's range has been set at 0 EUR to 4 million EUR. This allows some flexibility of the turnover over the years and at the same time controlling for outliers. The distribution after correction shows a positively skewed distribution of companies' turnover.

Profits/Losses Before Taxes

This variable corresponds to the profits or losses a company registered for each year of the sample.

The previous variables, the profits and losses of SMEs tend to substantially vary. To remove the outliers, only companies with a Profits/Losses lower than $250.000 \in$ were kept in the data base. With this, the variable tends to have a positive-kurtosis normal distribution, with a positive mean (on average, an SME has a profit of 15.232,96 EUR).

1.2. Applied criteria

To obtain reasonable values for some variables collected, further restrictions were conducted on the initially gathered sample from the AMADEUS database. Firms are required to respect several criteria during the whole period of the study.

Table 1: Imposed criteria on	SMEs
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Criterium	Lower bound limit	Upper bound limit
Total assets	0 EUR	3.000.000 EUR
Equity Funds	25.000 EUR	/
Annual Turnover	0 EUR	4.000.000 EUR
Profits before taxes	-250.000 EUR	250.000 EUR

Table 1 is a summary of the criteria applied to companies.

When a figure was missing for any variable whatever the year, the company was completely removed from the database. It was also checked in the sample that values were available for all companies and that the companies appeared well each year.

The database used for the analysis consists of 144.619 companies over the period 2009-2014.

3. Regression models

3.1. Theoretical equations

The profit after-tax is defined without any allowance for equity by:

$$\mathbf{P}_{at} = \mathbf{P} \cdot (1 - \mathbf{t}) \tag{1}$$

When the notional interest for the increase in equity is introduced, we have

$$P_{at} = P . (1 - t) + [IE . r . (t - t')]$$
(2)

With P = profit before tax

- IE = increase in Equity
- r = notional interest rate
- t = regular tax rate
- t' = reduced tax rate

The tax advantage depends then on the increase in equity (IE), notional interest rate, and difference between the regular and reduced tax rate. In Italy, the statutory corporate income tax rate is 31,4%. The application of the ACE incentives an increase of equity.

From the above equations, the following hypotheses are considered:

3.2. Hypotheses

1) The equity ratio is positively correlated with the ACE.

- 2) The gross variation of the equity ratio is positively correlated with the ACE.
- 3) The relative variation is positively correlated with the ACE.

The impact of the following variables was also evaluated in the analysis:

- 4) Smaller SMEs tend to react less to the introduction of the ACE.
- 5) More shareholders would reduce the impact of the ACE.
- 6) The impact of the ACE might depend on the location of the companies' headquarters.

3.3. Regression models

To test the effect of the ACE, a regression model was used with OLS.

The Equity Ratio (ER), calculated as the total equity divided by the total assets, is expressed as:

 $ER_{t} = reform^{*}italy_{t} + Reform_{t} + Turnover_{t} + Profits_{t} + GDPgrowth_{t}$ + inflation_{t} + year^{*}italy_{t} + year + e (3)

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 \Delta ER_t = reform^*italy_t + Reform_t + TotalAssets_t + Turnover_t + Profits_t + GDPgrowth_t 
+ inflation_t + year^*italy_t + e  (4)
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With e = error term

The variable Reform is the main variable of interest due to the interest of evaluating the impact of the introduction of the ACE on equity. It is a categorical variable which takes the value of 1 for the years 2012 to 2014 and 0 otherwise.

The variables Turnover, Profits are computed in thousand EUR. In the regression model (3), the variable TotalAssets is not included since it is used to calculate the Equity Ratio. The variable GDPGrowth and Inflation are included in the regression modules to take into account the macroeconomic factors that affect the equity.

Due to the difficulty to assess the impact of the Italian ACE without a counterfactual, a Difference-in-Difference is performed to control for trends occurring over time. Spain has been selected to perform the DiD. Spain presents several advantages justifying its utility in the DiD. The Spanish authorities have not implemented an ACE policy during 2009 and 2014. Moreover, Italy and Spain have the highest debt-equity ratio⁴ among the European countries. They also have similar GDP per capita⁵ and use the same currency. To stay neutral to the financing decision, the statutory corporate income tax rate must stay unchanged⁶. The corporate income tax rate remained constant in Italy and Spain over 2009 and 2014 with respectively 31,4% and 30,0%.

⁴ See de Mooij Devereux (2009)

⁵ Source : IMF World Economic Outlook Database, April 2018

⁶ Source : Boadway et al. 1983

4. Results and Analysis

4.1. Descriptive statistics

Data file was extracted from Amadeus and consists of the following variables: Company name, NACE code, NUTS3, shareholder's funds, profit/loss before tax, total assets, year, country, turnover. The Equity Ratio (ER) variable is created and calculated by dividing the total equity divided by the total assets.

The global data related to Equity Ratio are shown in Table 21:

- the average Equity Ratio (ER) per year for the Italian and Spanish selected companies
- the "variation ER", calculated as the difference of ER at year t and year t-1: $ER_t ER_{t-1}$

- the "relative growth", calculated as $(ER_t - ER_{t-1})/ER_{t-1}$

Table 2 summarizes the ER, the variation of the ER and the relative growth of the ER over the years for both Italy and Spain. On average, the Italian SMEs show an ER of 31,6% with an average relative growth of 0,89% while the average ER for Spanish companies is at a higher level: 45,79% and with a higher average relative growth, 2,05%. The ER indicates the proportion of shareholders capital used to fund a company's assets, that means the contribution of shareholders to the capital. It excludes any debt financing used by a company to raise funds. A higher equity ratio indicates a company's better long-term solvency position. It makes it easier for a company to obtain loan from banks and other financial institutions for future growth.

		IT		ES			
Year	ER	Variation ER	Relative Growth	ER	Variation ER	Relative Growth	
2009	30.96%			43.14%			
2010	31.10%	0.14%	0.45%	44.23%	1.09%	2.53%	
2011	31.18%	0.08%	0.26%	45.55%	1.32%	2.98%	
2012	32.09%	0.91%	2.92%	46.74%	1.19%	2.61%	
2013	32.25%	0.16%	0.49%	47.36%	0.62%	1.33%	
2014	32.36%	0.11%	0.34%	47.73%	0.37%	0.78%	

Table 2:

Figure 1 and Figure 2 show the trends of the annual average ER between 2009 and 2014 for the Italian and Spanish SMEs.



A significant increase of the Italian ER can be noticed in 2012 in Figure 2, year of the introduction of the ACE in Italy. The ER growth remains afterwards quite identical to levels previous to 2012.



Because the ER for the Spanish companies increases faster than for Italian companies, control variables (year*italy and year for ER, year*italy for Δ ER) have been added when the two countries are compared.

The trends of the Equity Ratio for Italian companies are compared according to the number of shareholders in the company. We notice that the increase if the ER is quite identical whatever the number of shareholders.

	2009	2010	2011	2012	2013	2014
1 shareholder	30.53%	30.66%	30.75%	31.67%	31.85%	31.82%
2 shareholders	30.89%	31.11%	31.30%	32.25%	32.45%	32.61%
3 shareholders	31.31%	31.32%	31.20%	32.06%	32.12%	32.20%

Figure 3: Trends of the Italian Equity Ratio between 2009 and 2014

Table 3 : Trends of the Italian Equity Ratio between 2009 and 2014 by shareholders



4.2. Regression results and analysis

4.2.1. General analysis of the impact of the ACE

The equity ratio and the annual variation of the equity ratio, ΔER (= $ER_t - ER_{t-1}$) are analyzed over the years 2009 - 2014. An increase in equity is expected in 2012 with the introduction of the ACE. Table 4 to Table 6 present the results of the various regressions, for Italian and Spanish companies selected based on criteria discussed previously.

Table 4 shows regression results for the effect of the introduction of the ACE on corporate equity for 85.310 Italian firms over the observation period 2009-2014. The independent variables are Reform, total assets, Turnover, Profits/Losses, GDP growth, Inflation. The regressions (1) and (2) consider the level of the equity ratio as the dependent variable. The regressions (3) and (4) consider the variation of the equity ratio as the dependent variable. Moreover, the regressions (2) and (4) cluster entries in the sample by company by adding a fixed-effect on firms. The "fixed effects" refer to model in which data are grouped according to observed factors. In this case, the companies have been grouped by their unique ID. So, each group consisted of six elements, the number of observed years. These six elements correspond to the same company but with data related to various years. The fixed effect helps controlling for unchanged characteristics of companies over time, such as the business or the managerial capabilities of a company.

	(1)	(2)	(3)	(4)
Dependent variable	ER	ER	ΔER	ΔER
Reform	.0108362***	.0067937***	.0259618***	.024651***
	(.0021952)	(.0006151)	(.0008921)	(.0010123)
Total Assets			-8.73e-06***	0001004***
			(2.69e-07)	(1.59e-06)
Turnover	0001148***	0000585***	-2.06e-06***	5.59e-06***
	(3.83e-07)	(9.30e-07)	(2.22e-07)	(9.62e-07)
Profits/Losses	.0008904***	.0003498***	.0003159***	.0004808***
	(5.60e-06)	(4.92e-06)	(2.51e-06)	(5.43e-06)
GDP growth	.1116645***	.0468957***	.3767065***	.3935154***
2	(.0335753)	(.0124772)	(.0178788)	(.0202887)
Inflation	.1412019***	.1417358***	1386138***	033889**
	(.0226419)	(.0087585)	(.0117529)	(.0143293)
FE firms	No	Yes	No	Yes
Number firms	85310	85310	85310	85310

Table 4: Impact of the ACE on the equity ratio and its variation for Italian SMEs

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels.

Without fixed effect, the equity ratio is estimated to increase by 1,08% with the introduction of the ACE. With fixed effects, this impact is estimated at around 0,68%. In the case of the variation of the equity ratio, the impact of the ACE is estimated to respectively 2,60% to 2,47% with the introduction of fixed effects. All these results are highly significant. Interestingly, the turnover and the profits or losses of a company have a minor negative impact on the equity ratio. The growth of the GDP has a positive impact on the level of the equity ratio and its variation. This can be due to an increase of investors' expected returns on investment during economic growth. Because the total assets are already used to compute the equity ratio of a company, the variable has not been used in regressions (1) and (2).

The Table 5 introduces a new variable, Year*italy. This numerical variable corresponds to the year multiplied by a dummy variable, Italy, equal to 1 if the SME's headquarter is located in Italy, equal to zero otherwise. It helps controlling for trends over time. All the regressions performed in Table 5 contain 85.310 Italian SMEs and control for fixed-effects by firms. The results for the regressions (2) and (4) from the Table 4 are reported in the Table 5 as regression (1) and (3) in order to highlight the impact of Year*italy. The regressions (2) and (4) contain the new variable. Concerning ER, the introduction of Year*italy highlights a bigger positive

impact of the ACE on the level of the equity ratio, ER. The effect of the ACE on the equity ratio is estimated between 0,68% and 0,87%. On the other hand, Year*italy tends to show a slightly smaller impact of the ACE on the variation of the equity ratio, Δ ER, from 2,47% to 2,30%. These results are statistically significant with a significance level below 1%.

The new variable Year*italy does not affect deeply the estimations for other control variables except "inflation". In that specific case, the impact of an increase of 1% of inflation on the level of equity is reduced from 0,14% to 0,06%. With Year*italy, an increase of inflation does not have a significant impact on the variation of the equity ratio

Table	5:	Impact	of	the	Italian	ACE	on	the	level	of	equity	ratio	of	SMEs,	with	time	trends
								C	ontro	bl							

	(1)	(2)	(3)	(4)
Dependent variable	ER	ER	ΔER	ΔER
Reform	.0067937***	.0087289***	.024651***	.0229071***
	(.0006151)	(.0006479)	(.0010123)	(.0013208)
Total Assets			0001004***	0000996***
			(1.59e-06)	(1.64e-06)
Turnover	0000585***	0000625***	5.59e-06***	5.62e-06***
	(9.30e-07)	(9.98e-07)	(9.62e-07)	(1.01e-06)
Profits/Losses	.0003498***	.0003517***	.0004808***	.0004835***
	(4.92e-06)	(4.97e-06)	(5.43e-06)	(5.50e-06)
GDP growth	.0468957***	.0684452***	.3935154***	.3588209***
	(.0124772)	(.0125445)	(.0202887)	(.0273906)
Inflation	.1417358***	.0620545***	033889**	.0261439
	(.0087585)	(.0163426)	(.0143293)	(.0259906)
Year*italy		.0009841***		0009423**
		(.0002609)		(.0004057)
FE firms	Yes	Yes	Yes	Yes
Number firms	85310	85310	85310	85310

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels. Total Assets, Turnover & Profits/Losses are computed in thousand EUR

The Table 6 shows regression results for the effect of the introduction of the ACE on corporate equity for Italian firms by applying a difference-in-difference (DiD) with the Spanish firms. The sample collects data for 144.619 companies. The regressions (2) and (4) also contain in addition the variables year*Italy and year to control for varying time trends between Spain and Italy (see "Descriptive Statistics").

Since we include the Spanish SMEs, the use of the "interaction" dummy variable Reform*Italy is important to obtain coherent results. This shows the importance of using variables controlling for time trends. Without variables controlling for time trends, results show a negative impact of the ACE on the level of Italian companies' equity ratio (-1,42%), which is incoherent with the goals of the Italian tax reform. After controlling for time trends with the regressions (2) and (4), the ACE is taken responsible for an increase of the equity ratio equivalent to 0,31% and an

increase of the variation of the equity ratio up to 1,62%. These results have a statistical significance at 1%. By only considering the Italian companies, the influence of the ACE on the variation of the equity ratio Δ ER is estimated at 2,30%. However, by considering the Italian and the Spanish companies, the impact of the ACE on Δ ER is lower, at around 1,62%. This difference shows the importance of comparing the Italian and the Spanish contexts. In this case, the assessed impact of the ACE would be overestimated by 0,68% compared to the results obtained for Italian firms only.

The Difference-in-Difference method requires to have a control group with vigorously parallel trends, in terms here of ER and Δ ER over the year, outside the year of introduction to ACE, to provide accurate results. It can be easily noticed from Table 2, that the growth of ER varies faster in Spain than in Italy. The figures and their interpretation should then be considered with care. For more accurate results, a new control group should be created with closer similarities with the selected Italian SMEs such that their trends are well parallel.

	(1)	(2)	(3)	(4)
Dependent variable	ER	ER	ΔER	ΔER
Reform*italy	0142282***	.0031103***	.0112563***	.0162183***
-	(.000621)	(.000602)	(.0004686)	(.0007803)
Reform	.0045516***	0020365***	.0066459***	.0029344***
	(.0005812)	(.0005998)	(.0008451)	(.0010433)
Total Assets			0001266***	0001255***
			(1.48e-06)	(1.51e-06)
Turnover	0000589***	0000587***	.0000114***	.0000114***
	(7.68e-07)	(7.67e-07)	(7.90e-07)	(8.04e-07)
Profits/Losses	.0003267***	.0003265***	.0005321***	.0005337***
	(4.04e-06)	(4.05e-06)	(4.58e-06)	(4.60e-06)
GDP growth	099958***	0164422	.2870824***	.2623384***
C	(.0107517)	(.010667)	(.0180194)	(.0191918)
Inflation	.3114949***	.2761752***	.0396928***	.0931719***
	(.0066573)	(.0122239)	(.0116444)	(.0137544)
Year*italy		0060853***		0018483***
-		(.0002341)		(.0002502)
Year		.0040922***		
		(.0002647)		
FE firms	Yes	Yes	Yes	Yes
Number firms	144619	144619	144619	144619

Table 6: impact assessment of the Italian ACE by comparing Italian & Spanish SMEs

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels. Total Assets, Turnover & Profits/Losses are computed in thousand EUR

4.2.2. Influence of the SMEs' initial shareholders' funds on the impact of the ACE

Table 7 shows the effect of the shareholders' funds on the growth of the equity ratio and on the variation of the equity ratio of Italian firms. The Italian companies have been assorted by their level of shareholders' funds in 2009. The observation period is made between 2009 and 2014. The sample has been divided into 3 groups:

- low shareholders' funds (between 25.000 EUR and 50.000 EUR)
- medium shareholders' funds (between 50.000 EUR and 100.000 EUR)
- high shareholders' funds (100.000 EUR and above)

The results in Table 7 show that the ACE has a more important impact on the equity ratio of firms with medium and high shareholders' funds in 2009 (respectively 0,95% and 0,90%) compared to firms with lower shareholders' funds (around 0,46%). The results obtained have a statistical significance at 1% for each category of firms.

Interestingly, results show that firms with higher Shareholders' funds are less impacted by the macroeconomic control variables such as "Inflation" and "GDP growth". One possible explanation is that smaller companies tend to be more sensitive to the economic situation of the country than bigger companies. Their economic performance makes these companies' leverage more sensitive to macroeconomic variables.

Dependent variable	ER	ER	ER	ER
Shareholders' funds (2009)	all	[25k-50k)	[50k-100k)	[100k)
Reform	.0087289***	.0045758***	.0095424***	.0090993***
	(.0006479)	(.0016442)	(.0013246)	(.0008235)
Turnover	0000625***	0000748***	0000711***	0000614***
	(9.98e-07)	(2.73e-06)	(2.11e-06)	(1.21e-06)
Profits/Losses	.0003517***	.0005693***	.0004828***	.0002812***
	(4.97e-06)	(.0000182)	(.0000128)	(5.51e-06)
GDP growth	.0684452***	.1302603***	.0946051***	.0218088
	(.0125445)	(.0326934)	(.0261074)	(.0156346)
Inflation	.0620545***	.2933625***	.0763368**	0197037
	(.0163426)	(.041734)	(.0333945)	(.0206901)
Year*italy	.0009841***	.0061835***	.003476***	0019319***
	(.0002609)	(.0006586)	(.0005324)	.0003315
FE firms	Yes	Yes	Yes	Yes
Number firms	85310	15474	22554	47337

Table 7: Impact of the shareholders' funds on the level of the equity ratio, considering only Italian companies

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels.

Total Assets, Turnover & Profits/Losses are computed in thousand EUR

The Table 8 aims at comparing Italian companies assorted by their level of shareholders' funds in 2009 with the Spanish companies. The regressions are performed by applying a differencein-difference. Such as for the Table 4, the variables "Year*italy" and "Year" are introduced in the model in order to control for time trends.

The results on the Table 8 present the same trends as in Table 7. The ACE has more impact on SMEs with funds over 50.000 EUR than with small funds. For these companies, the results are highly significant. Interestingly, even though the ACE has a positive impact on the level of the equity ratio of Italian firms with shareholders' funds lower than 50.000 EUR, the impact is nearly divided by 2 for such companies. This means that the ACE has a reduced impact for the smallest SMEs while these companies would have a bigger need.

Dependent variable	ER	ER	ER	ER
Shareholders' funds (2009)	all	[25k-50k)	[50k-100k)	[100k)
Reform*italy	.0031103***	.0017325	.0044862***	.0039287***
	(.000602)	(.0020884)	(.0014512)	(.000704)
Reform	0020365***	003494	0007843	0031038***
	(.0005998)	(.0021369)	(.0014768)	(.0006818)
Turnover	0000587***	0000698***	0000682***	0000592***
	(7.67e-07)	(2.38e-06)	(1.80e-06)	(8.95e-07)
Profits/Losses	.0003265***	.0005687***	.0005142***	.0002634***
	(4.05e-06)	(.0000176)	(.0000119)	(4.35e-06)
GDP growth	0164422	.0492548	.0125809	0600358***
	(.010667)	(.0303609)	(.0234089)	(.0129302)
Inflation	.2761752***	.4657574***	.2307484***	.2266765***
	(.0122239)	(.0377181)	(.0280482)	(.0146059)
Year*italy	0060853***	0118208***	0085558***	0068237***
	(.0002341)	(.000755)	(.0005453)	.000278
Year	.0040922***	.0154587***	.0097964***	.001469***
	(.0002647)	(.0008859)	(.0006374)	(.0003097)
FE firms	Yes	Yes	Yes	Yes
Number firms	144619	21624	33368	90128

Table 8: Impact of the shareholders' funds on the level of the equity ratio, comparing Italian and Spanish companies

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels.

Total Assets, Turnover & Profits/Losses are computed in thousand EUR

Table 9 aims at analyzing the impact of the ACE on the variation of the equity ratio of Italian firms grouped by their shareholders' funds, and compared them with the Spanish companies. The regressions perform again a difference-in-difference and contain the control variables catching time trends. The results obtained in Table 9 are slightly different from the results computed in the Table 7. The ACE significantly and positively impacts the variation of the equity ratio (Δ ER) for all categories of companies. However, the companies with shareholders'

funds lower than 100.000 EUR faced an increase in Δ ER of respectively 1,16%. Companies with shareholders' funds superior to 100.000 EUR faced a larger increase in Δ ER (1,94%).

Dependent variable	ΔER	ΔER	ΔER	ΔER
Shareholders' funds (2009)	all	[25k-50k)	[50k-100k)	[100k)
Reform*italy	.0162183***	.0116265***	.0117169***	.0193597***
-	(.0007803)	(.002432)	(.001762)	(.0009406)
Reform	.0029344***	.0057672	.0058381**	.0024534**
	(.0010433)	(.0035995)	(.0025271)	(.001183)
Total Assets	0001255***	0001051***	0001128***	0001317***
	(1.51e-06)	(4.50e-06)	(3.26e-06)	(1.81e-06)
Turnover	.0000114***	8.22e-06***	7.21e-06***	.0000119***
	(8.04e-07)	(2.61e-06)	(1.83e-06)	(9.51e-07)
Profits/Losses	.0005337***	.0007387***	.000724***	.0004854***
	(4.60e-06)	(.0000207)	(.0000143)	(4.94e-06)
GDP growth	.2623384***	.2278686***	.2357545***	.2958814***
-	(.0191918)	(.0547256)	(.0419637)	(.0228417)
Inflation	.0931719***	0591153	.069029**	.1191984***
	(.0137544)	(.0452985)	(.0321714)	(.0158529)
Year*italy	0018483***	0005213	0013179**	0024287***
	(.0002502)	(.0007631)	(.0005569)	(.0003046)
FE firms	Yes	Yes	Yes	Yes
Number firms	144619	21624	33368	90128

Table 9: Impact of the shareholders' funds on the variation of the equity ratio, comparing Italian and Spanish companies

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels. Total Assets, Turnover & Profits/Losses are computed in thousand EUR

One possible reason for these differences between categories of firms can be due to the difficulty of smaller companies to finance their investment by increasing their equity compared to their debt. SMEs often have difficulties to finance their activities and investment with equity due to several factors such as their size and the higher risk they imply. Tables 7, 8 and 9 support the idea that these factors might also occur among SMEs.

4.2.3. Influence of the number of shareholders on the impact of the ACE

The Table 10 and the Table 11 show regression results that aim at capturing the effect of the ACE on the level of equity ratio and the variation of the equity ratio with respect to the number of shareholders. Because a comparison among Italian companies is made, the sample includes the Italian SMEs only.

The results on Table 10 show that the ACE has a bigger impact on SMEs with a higher number of shareholders. Indeed, for firms with 1 shareholder, the ACE increased the level of equity ratio by 0,77%, firms with 2 shareholders by 0,81% and firms with 3 shareholders by 1,05%.

The results on Table 11 show that the impact of the ACE on the variation of the equity ratio is almost the same for firms with 1 and 2 shareholders (respectively 2,07% and 2,10%). However, according to the results, the companies with at least 3 shareholders have increased the variation of the equity ratio by 2,63%.

The results obtained here differ from the analysis of the ACE on Austrian SMEs, Petutschnig & Rünger (2017). They observe that a higher number of shareholders implies conflicts of interest among them. This causes the Austrian ACE, "Allowance for Growth and Investment", to be less effective for companies with more shareholders.

Dependent variable	FD	FP	FP	FD
Dependent variable	LK	LK	LK	LK
Number of shareholders	all	1	2	3&+
Reform	.0087289***	.0077233***	.0080611***	.0105294***
	(.0006479)	(.0016607)	(.000898)	(.0011109)
Total Assets				
Turnover	0000625***	0000702***	0000635***	0000551***
	(9.98e-07)	(2.19e-06)	(1.42e-06)	(1.80e-06)
Profits/Losses	.0003517***	.0003731***	.0003558***	.0003295***
	(4.97e-06)	(.0000119)	(7.20e-06)	(8.29e-06)
GDP growth	.0684452***	.0643551**	.0757297***	.0579788***
	(.0125445)	(.031888)	(.0175785)	(.0212053)
Inflation	.0620545***	.1178486***	.0817242***	005425
	(.0163426)	(.042146)	(.022551)	(.0281783)
Year*italy	.0009841***	.0002827	.0013954***	.0007545*
	(.0002609)	(.00066)	(.0003596)	(.0004576)
FE firms	Yes	Yes	Yes	Yes
Number firms	85310	15755	43422	26454

Table 10 : ER- I	Number Shareh	olders Italy,	with year*Italy
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***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels.

Dependent variable	ΔER	ΔER	ΔER	ΔER
Number of shareholders	all	1	2	3&+
Reform	.0229071***	.0207212***	.020957***	.0262971***
	(.0013208)	(.0033337)	(.0018054)	(.002292)
Total Assets	0000996***	0001055***	0001007***	0000951***
	(1.64e-06)	(3.98e-06)	(2.28e-06)	(2.85e-06)
Turnover	5.62e-06***	4.22e-06*	6.17e-06***	6.00e-06***
	(1.01e-06)	(2.53e-06)	(1.38e-06)	(1.77e-06)
Profits/Losses	.0004835***	.0005003***	.0004923***	.0004588***
	(5.50e-06)	(.0000133)	(8.17e-06)	(9.07e-06)
GDP growth	.3588209***	.3244192***	.3476602***	.3715782***
	(.0273906)	(.0690556)	(.0376498)	(.0465882)
Inflation	.0261439	.0978293	.0451137	0359537
	(.0259906)	(.0671035)	(.0361963)	(.0450247)
Year*italy	0009423**	0018962*	0010812*	0004272
	(.0004057)	(.0010659)	(.0005639)	(.0007103)
FE firms	Yes	Yes	Yes	Yes
Number firms	85310	15755	43422	26454

Table 11 : Impact of the ACE on the variation of equity of Italian companies, by number of shareholders

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels.



Figure 4: Impact of the ACE on ER and ΔER, by number of shareholders

4.2.4. Geographic disparities with the ACE

In this section, the paper aims at analyzing the impact of the ACE across the Italian regions to detect any disparities. Since the ACE reduces the taxable corporate income tax base, there are few doubts that a geographic analysis of the Italian ACE is relevant. Following the Italian unification in the mid-1860s, the economic disparities between Northern Italy and Southern Italy (often referred as "Mezzogiorno") has been an important concern for the Italian authorities. Persisting inequalities still have consequences for the country, from an increase of tax evasion (Christie & Holzner 2006), to higher criminality and a lessened social cohesion among citizens (Ballarino et al. 2012). One way to reduce inequalities is through the implementation of an efficient tax system with an effective redistribution from wealthier to poorer citizens. In this paper, the geographic analysis of the effectiveness of the ACE has been performed at two different levels. The first level of analysis is the "NUTS1", corresponding to 19 traditional regions of Italy and the region of *Trentino - Alto Adige* separated in 2 entities.

The results showed in Table 12 highlight large disparities among regions in Italy. The ACE has a much smaller impact on the level of the equity ratio and on the variation of the equity ratio in *Mezzogiorno*, corresponding to South and Insular Italy. A major concern for the Italian authorities is that the implementation of the ACE appears to have insignificant impact on the level of equity ratio in South and Insular Italy. This can lead to an increase of the already existing inequalities among regions.

Regions group	Name of the group	On the level of ER	On the variation of ER
ITC	Northwest Italy	0.0095446***	0.0311281***
ITH	Northeast Italy	0.0074960***	0.0344873***
ITI	Central Italy	0.0091768***	0.0262950***
ITF	South Italy	0.0019144	0.0185740***
ITG	Insular Italy	-0.0004705	0.0100278**

Table 12 : NUTS1 analysis of the impact of the ACE

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels.

Disparities also occur within the regions themselves (see Table 13). For example, the level of equity of SMEs in *Liguria* increased by 1,53% and in *Lombardia* by "only" 0,9%, even though the two regions are in Northwest Italy.

It must be mentioned that some regions have very few SMEs (see Table 14 and figure 6). This can bias slightly the geographic analysis. However, the figures 7 and 8 derived from the data give a good insight of the geographic disparities across Italy.

Regions	Name of the region	On the level of ER	On the variation of ER
ITC1	Piemonte	0.0105722***	0.0329465***
ITC2	Valle d'Aosta	0.0083214	0.0278885
ITC3	Liguria	0.0152533***	0.0385615***
ITC4	Lombardia	0.0087092***	0.0299857***
ITH1	Trentino	0.0040634	0.0274584**
ITH2	Alto Adige	0.0071120	0.0374283***
ITH3	Veneto	0.0060917***	0.0320265***
ITH4	Friuli-Venezia Giulia	0.0125092***	0.0416357***
ITH5	Emilia-Romagna	0.0084004***	0.0364699***
ITI1	Toscana	0.0095625***	0.0282853***
ITI2	Umbria	0.0087123*	0.0255971***
ITI3	Marche	0.0068285***	0.0339781***
ITI4	Lazio	0.0101778***	0.0232632***
ITF1	Abruzzo	-0.0018003	0.0176957**
ITF2	Molise	0.0181658	0.0223384
ITF3	Campania	0.0027778	0.0170588***
ITF4	Puglia	0.0051841*	0.0238161***
ITF5	Basilicata	-0.0046277	0.0135371
ITF6	Calabria	-0.0094808*	0.0031712
ITG1	Sicilia	-0.0000635	0.0096704*
ITG2	Sardegna	-0.0014289	0.0110228

Table 13: NUTS2 analysis of the impact of the ACE

***, ** and * indicate the statistical significance at the 1%, 5% and 10% levels, respectively.

Regions	Name of the region	Number of companies
ITC1	Piemonte	5114
ITC2	Valle d'Aosta	181
ITC3	Liguria	1725
ITC4	Lombardia	18747
ITH1	Trentino	517
ITH2	Alto Adige	702
ITH3	Veneto	8869
ITH4	Friuli-Venezia Giulia	1797
ITH5	Emilia-Romagna	7524
ITI1	Toscana	6781
ITI2	Umbria	1092
ITI3	Marche	2498
ITI4	Lazio	9070
ITF1	Abruzzo	1525
ITF2	Molise	285
ITF3	Campania	7196
ITF4	Puglia	4324
ITF5	Basilicata	495
ITF6	Calabria	1449
ITG1	Sicilia	3886
ITG2	Sardegna	1527

Table 14: Number of SMEs by Italian regions

Figure 5: Northern Italy and Southern Italy, regions of Italy





Graduation depending on the number of companies:



Figure 7: Impact of the ACE on the level of Equity Ratio of companies



Graduation depending on the value:



Figure 8: Impact of the ACE on the variation of the Equity Ratio of companies



Graduation depending on the value:



6. Comparison with the Austrian ACE

Petutschnig and Rünger (2017) performed an analysis of the impact of the ACE on Austrian companies. Even though their studies evaluate the effects of the tax policy on corporate equity and profit distribution in general, some results can be exploited to extrapolate and estimate the impact more specifically on SMEs.

Their analysis puts in evidence that the ACE is responsible for increasing the corporate equity ratio by 5,5% and reduce the profit distributions by 7,6%.

Table 15: Effects of AIE on Equity, 1996-2003⁷

Dependent variable	ER_t
Reform _t	0.0555***
	(0.0107)

***, ** and * indicate the statistical significance at the 1%, 5% and 10% levels, respectively.

When performing a difference-in-difference with Swedish companies, the impact of the Austrian ACE is given by:

Table 16: Effects of the AIE with a difference in difference, 1996-2003⁸

Dependent variable	ER
Austria _t . Reform	0.0344***
	(0.0102)

***, ** and * indicate the statistical significance at the 1%, 5% and 10% levels, respectively.

Their study also analyzes the impact of the Austrian ACE depending on the size of companies through total assets. To do so, the sample is divided in quartiles.

Table 17: Effects of the AIE with DiD by quartile, 1996-2003⁹

Dependent variable		ER_t		
Quartile	1	2	3	4
Austria _t . Reform _t	0.1378*** (0.0517)	0.0718*** (0.0105)	0.0277*** (0.0081)	0.0071 (0.0091)

***, ** and * indicate the statistical significance at the 1%, 5% and 10% levels, respectively.

Regression results performed on Austrian companies grouped into quartiles according to the average amount of total assets for the years before the Austrian reform (1996-1999) show the positive effects on equity for companies and the decreasing effect for upper quartiles. The first

⁷ Source : Petutschnig & Rünger (2017), The Effects of a Tax Allowance for Growth and Investment – Empirical Evidence from a Firm Level Analysis

⁸ Idem.

⁹ Idem.

quartile was considered in this current study as a good representation of Austrian SMEs for the comparison with the Italian SMEs.

Petutschnig and Rünger (2017) study also the influence of the number of shareholders on the effectiveness of the ACE. In opposition with this paper for Italy, they find that the number of shareholders decreases the effect of the tax reform. They find that firms owned by a single shareholder increase on average by 19,1% the equity ratio through the ACE. Companies owned by more shareholders do no significantly increase their equity ratio.

Table 18 shows regression results for the effect of the introduction of the AIE, starting in 2000, on corporate equity for stand-alone domestic firms over the observation period 1996-2003, controlling for different ownership structures of the firm.

Dependent variable	ER_t
Reform	0.0838
Individual,	(0.0701) -0.4767***
Individual ₂	(0.1084) -0.1441*
Individual ₃	(0.0846) 0.0455
Individual _{1,t} .Reform _t	(0.0883) 0.1913***
Individual _{2,t} . Reform _t	(0.0810) 0.1021
Individual _{3,t} . Reform _t	(0.0741) 0.0268
-	(0.0980)

Table 18: Effects of AIE by Number of Individual Shareholders, 1996-2003¹⁰

***, ** and * indicate the statistical significance at the 1%, 5% and 10% levels, respectively.

¹⁰ Source : Petutschnig & Rünger (2017), The Effects of a Tax Allowance for Growth and Investment – Empirical Evidence from a Firm Level Analysis

7. Comparison with the Belgian ACE

Results of studies performed on Belgian companies suggest that the ACE in Belgium led to an increase of corporate equity and simultaneously to a decrease of the debt-equity ratio. Aus dem Moore (2014) found "highly significant and robust estimates that correspond to an increase in investment activity by small and medium-sized firms of about 3% in response to the ACE reform". For information, Andries (2017) and Zangari (2014) provided also evidence that multinationals seemed to have rather taken advantages of the notional interests as a tax-planning device.

As previously expressed, the Belgian ACE system is considered as a hard ACE system while the Austrian and Italian ACE system is considered as a soft one. To analyze the impact of the Belgian ACE, French companies are used to perform a difference-in-difference. They find that the Belgian ACE increased by 4,4% the equity ratio of Belgian SMEs (see Table 19).

Country	Belgium
ACE	0.044***
	(0.004)
Profitability	0.156***
	(0.021)
Tangibility	-0.241***
	(0.010)
GDP growth	0.005***
-	(0.001)
Inflation	0.003
	(0.002)
Belgium dummy	-0.083***
	(0.005)
Non-Debt Tax shield	-0.145***
	(0.053)
Year	-0.029***
	(0.002)
FE firms	Yes
Industry dummy	Yes
Number firms	70170

Table 19: The impact of the Belgian ACE with DiD on the level of equity ratio of SMEs¹¹

***, ** and * indicate the statistical significance at the 1%, 5% and 10% levels, respectively.

¹¹ Source : Princen, Savina. "Taxes do Affect Corporate Financing Decisions : The Case of Belgian ACE", 2012

Table 20 summarizes the impact of the ACE depending on the country that implemented an ACE :

Country	Austria	Belgium	Italy
Dependent variable	ER	ER	ER
Reform*austria / ACE / Reform*italy	0.0344***	0.044***	0.0031***
	(0.0102)	(0.004)	(.000602)
Reform	-0.0034	-	-0.0020***
	(0.0057)		(.0005998)
Turnover	NR	-	-0.0001***
			(7.67e-07)
Profits/Losses	NR	-	0.0003***
			(4.05e-06)
Profitability	-	0.156***	-
		(0.021)	
Tangibility	-	-0.241***	-
		(0.010)	
GDP growth	NR	0.005***	-0.0164
		(0.001)	(.010667)
Inflation	NR	0.003	0.2762***
		(0.002)	(.0122239)
Year*italy	-	-	-0.0061***
			(.0002341)
Belgium dummy	-	-0.083***	-
		(0.005)	
Non-Debt Tax shield	NR	-0.145***	-
		(0.053)	
Year	NR	-0.029***	.0040922***
		(0.002)	(.0002647)
FE firms	Yes	Yes	Yes
Industry dummy	No	Yes	No
Number firms	85310	70170	85310

Table 20: Impact of ACEs on the equity ratio of SMEs by country

NP stands for "not reported".

***, ** and * indicate the statistical significance at the 1%, 5% and 10% levels, respectively.

The impact in Belgium is the highest one among the three countries, which is not really surprising as it involves the total equity, contrary to the other countries as Austria and Italy which involve only the growth of equity. What is more surprising is the relatively small impact in Italy, compared to Austria. The ER for Austria in 2009 was 37,59% when in Italy 30,96%. A smaller impact might be explained by companies more generally led by the family which tends to induce a more traditional but less efficient management. Indeed, the average Italian companies are small. Their prevailing family business model limits the use of external equity and debt.as small and medium-sized businesses, they face difficulties to sustain medium and long-term projects and lack of entrepreneurial culture for external equity financing¹².

¹² Source : Private Equity Targets, Strategies for Growth, Market Barriers and Policy Implications, Francesco Baldi, Editions Springer, 2013

8. Conclusion

The first part of the study puts in evidence that the tax relief, also called Allowance for Corporate Equity (ACE) has a real positive impact on the increase of equity for the Italian SMEs. Such impact is estimated at 0,87%. The impact is even amplified for SMEs with more than 1 shareholder (e.g. 1,05% on average for SMEs with at least 3 shareholders) and for SMEs located in Northern Italy (e.g. 1,53% on average for SMEs in Liguria). The increase of the equity ratio due to the ACE is only observed in the year of its introduction.

The comparison with Austria and Belgium, countries which also applied an allowance on capital invested, puts in evidence other discrepancies. For the Austrian SMEs, the impact of the ACE was decreasing with the number of shareholders for the Austrian SMEs while in Italy, the study shows opposite trends. This can probably be explained by the prevailing family business model in Italy.

The efficiency of the ACE in Italy might be debatable. Its impact on the growth of the Equity Ratio is much smaller than in Austria, and the average equity ratio level in Italy still remains lower than the majority of other European countries, specifically lower than in Spain, the country used as the control group for the regressions, Austria and Belgium. A comparison with Belgium, where the allowance was applied on the entire book-value of the capital invested, was also made. The Belgian tax policy shows the largest positive impact on the SMEs' equity ratio, estimated to 4,4%.

The current study shows several discrepancies in the impact of the ACE within Italy and when compared to other countries. It would be interesting to investigate the relative importance of each disparity. The impact of a possible introduction of an ACE through the CCCTB at the European level could then be evaluated for the SMEs.

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Summary

1. Introduction

The difference of tax deduction for debt and equity encourages companies to rely on debt rather than on equity funds when companies finance themselves as they can deduct debt payments from their taxable income tax base. This asymmetric taxation system on equity and debt is seen by the European Commission as the main reason of a low equity level. Concerns from the financial crisis of 2008 have highlighted weaknesses in the financial health of highly leveraged companies.

A tax allowance on equity or on the increase of equity could help reduce this debt-bias. Devereux and Freeman (1984) developed the concept of "Allowance for Corporate Equity", ACE, as an incentive for companies to rely more on equity funds than the current tax systems would usually suggest. The ACE consists of a new allowance proportional to the capital financed through equity multiplied by a nominal interest rate, usually the market risk-free interest rate.

Thanks to the liberalization of capital movements inside the EU borders¹³, capital has become increasingly mobile. To attract highly mobile capital, numerous countries have decreased their statutory interest rate, causing competition among countries. One of the drawbacks of tax competition is its harmful effect for public finances.

Since the financial crisis of 2007 and the sovereign debt crisis that followed, the European Commission urged in 2015 the restart of a European project for a "Common Consolidated Corporate Tax Base" (CCCTB). The CCCTB is a set of tax reforms aiming at profoundly restructuring the way EU members and companies interact. The aims of the CCCTB are to impose a fair tax burden to each economic player, individuals, SMEs and MNEs, to reduce tax competition among EU countries and to harmonize the computation of the taxable corporate income base among EU members.

The CCCTB is expected to stimulate the R&D private expenditures, facilitate the internationalization of companies inside the EU and reduce the debt-bias. The European Commission considers several methods to reduce it, and backs up the idea for an "Allowance for Growth and Investment" (AGI). An AGI is often called soft-ACE, as it allows tax relief on additional capital invested through equity in the company. In comparison, a hard-ACE relies on the total book value of the firm's equity. Since few countries in the EU have implemented a

¹³ See the Council Directive 88/361/EEC

tax relief on capital in the 2000s and 2010s, a comparison and evaluation of their policies would be insightful.

ACE in Austria, Belgium and Italy

Four European countries have or had a soft-ACE: Austria, from 2000 to 2004, Italy between 1998 and 2003 and again since 2012, Latvia, from 2009 to 2014, and Portugal, from 2010 to 2013. Three countries applied a hard-ACE: Belgium, from 2006, Croatia, from 1994 to 2000, and Liechtenstein, since 2011.

In this paper, a comparison between the Belgian, Austrian and Italian experience with ACE for SMEs is made. To do so, let's briefly describe the specificities of a tax policy applied to each country.

Belgium

Belgium introduced a hard-ACE in 2006 with notional interests computed on the book value of the whole equity of companies. This system has been very controversial because seen as mainly favoring large MNEs compared to SMEs (Zangari 2014). Moreover, the increase of investment has been seen as largely insufficient compared to the policy's cost on the public budget. However, Princen (2012) highlights that both SMEs and MNEs decreased their leverage thanks to the ACE by respectively 4,6% and 4,9%.

Austria

The Austrian government introduced a soft-ACE between 2000 and 2004 for companies. During that time period, unlike the Belgian ACE, only the increase of the book value of equity was subject to notional interests. The study shows that the soft-ACE increased the equity ratio of Austrian companies by 3,4%. They also discovered that the impact of the tax reform decreases with the size of the companies.

Italy

The Italian authorities introduced a soft-ACE from 1998 to 2003 and reimplemented it in 2012. Empirical analyses of the Italian soft-ACE report an average leverage reduction of 4,2% in 1998 (Barnasconi, 2005) and 2,5% in 2012 (Panteghini, 2012).

What can SMEs expect from an ACE?

One of the conclusions from the European Commission report of 2016 is that an ACE at the European Union scale could be largely beneficial to all actors. One major drawback of the impact assessment from the European Commission is that their model uses global data and information issued from large companies and corporations. The model is therefore currently

unable to estimate the impact of the CCCTB reform, and then the AGI proposal, on SMEs. To fill this gap, the European Commission calls for further researches in order to assess the impact of its proposal on SMEs.

This paper aims at answering the call by empirically assessing the impact of the Italian ACE reimplemented since 2012 on specifically SMEs with a focus on debt-bias. A comparison is then made with the Austrian soft-ACE and the Belgian hard-ACE. Studying the data on Italian SMEs, and comparing with other countries provide new insights on the impact of the ACE and help to understand opportunities of an ACE at the European level on SMEs.

2. Data and methodology

2.1. Methodology

Data on national small and medium-sized enterprises (SMEs) were collected from the AMADEUS database¹⁴ for Italy and Spain. Because the Italian ACE has been set up since 2012, the data collected concerns years from 2009 to 2014, the goal being to collect information 3 years prior and post policy implementation.

2.2. Variables

Criteria applied to focus on SMEs are summarized in Table 1:

Criterium	Lower bound limit	Upper bound limit
Total assets	0 EUR	3.000.000 EUR
Equity Funds	25.000 EUR	/
Annual Turnover	0 EUR	4.000.000 EUR
Profits before taxes	-250.000 EUR	250.000 EUR

Table 1	Imposed	criteria	on SMEs
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Table 1 is a summary of the criteria applied to companies.

When a data was missing for any variable whatever the year, the company was completely removed from the list. It was also checked in the sample that values were available for all companies and that the companies appeared well each year.

The database used for the analysis consists of 144.619 companies over the period 2009-2014.

3. Regression model

To test the effect of the ACE, a regression model was used with OLS.

¹⁴ The Amadeus database is a data-collection software developed by Bureau van Dijk Electronic Publishing

The Equity Ratio (ER), calculated as the total equity divided by the total assets, is expressed as:

$$\begin{split} ER_t = reform*italy_t + reform_t + turnover_t + Profits_t + GDPgrowth_t \\ + inflation_t + year*italy_t + year + e \end{split}$$

$$\label{eq:deltaER} \begin{split} \Delta ER_t = reform^*italy_t + reform_t + TotalAssets_t + turnover_t + Profits_t + GDPgrowth_t \\ + inflation_t + year^*italy_t + e \end{split}$$

with e = error term

The variable Reform is the main variable of interest due to the interest of evaluating the impact of the introduction of the ACE on equity. It is a categorical variable which takes the value of 1 for the years 2012 to 2014 and 0 otherwise.

The variables TotalAssets, Turnover and Profits are compute in thousand EUR. In the regression model (3), the variable TotalAssets is not included since it is used to calculate the Equity Ratio. The variable GDPGrowth and Inflation are included in the regression modules to consider the macroeconomic factors which affect the equity.

Due to the difficulty to assess the impact of the Italian ACE without a counterfactual, a Difference-in-Difference is performed to control for trends occurring over time. Spain has been selected to perform the DiD. Spain presents several advantages justifying its utility in the DiD. The Spanish authorities have not implemented an ACE policy during 2009 and 2014. Moreover, Italy and Spain have the highest debt-equity ratio¹⁵ among the European countries. They also have similar GDP per capita¹⁶ and use the same currency. To stay neutral to the financing decision, the statutory corporate income tax rate must stay unchanged¹⁷. The corporate income tax rate remained constant in Italy and Spain over 2009 and 2014 with respectively 31,4% and 30,0%.

¹⁵ See de Mooij Devereux (2009)

¹⁶ Source : IMF World Economic Outlook Database, April 2018

¹⁷ Source : Boadway et al. 1983

4. Results and Analysis

4.1. Descriptive statistics

The data file was extracted from Amadeus and consists of the following variables: Company name, NACE code, NUTS3, shareholder's funds, profit/loss before tax, total assets, year, country, turnover. The Equity Ratio (ER) variable is created and calculated by dividing the total equity by the total assets.

The global data related to Equity Ratio are shown in Table 2:

- the average Equity Ratio per year for the Italian and Spanish selected companies
- the variation ER, calculated as the difference of ER at year t and year t-1: $ER_t ER_{t-1}$

- the relative growth, calculated as $(ER_t - ER_{t-1})/ER_{t-1}$

The Table 2 summarizes the ER, the variation of the ER and the relative growth of the ER over the years for both Italy and Spain. On average, the Italian SMEs show an ER of 31,6% with an average relative growth of 0,89% while the average ER for Spanish companies is at a higher level: 45,79% and with a higher average relative growth, 2,05%. The ER indicates the proportion of shareholders capital used to fund a company's assets, that means the contribution of shareholders to the capital. It excludes any debt financing used by a company to raise funds.

		IT			ES	
Year	ER	Variation ER	Relative Growth	ER	Variation ER	Relative Growth
2009	30.96%			43.14%		
2010	31.10%	0.14%	0.45%	44.23%	1.09%	2.53%
2011	31.18%	0.08%	0.26%	45.55%	1.32%	2.98%
2012	32.09%	0.91%	2.92%	46.74%	1.19%	2.61%
2013	32.25%	0.16%	0.49%	47.36%	0.62%	1.33%
2014	32.36%	0.11%	0.34%	47.73%	0.37%	0.78%

Table 2:

We can notice in Figure 1 the trends of the annual average ER between 2009 and 2014 for the Italian and Spanish SMEs.

A significant increase of the Italian ER can be noticed in 2012 in Figure 2, year of the introduction of the ACE in Italy. The ER growth remains afterwards quite identical to levels previous to 2012.



Because the ER for the Spanish companies increases faster than for Italian companies, control variables (year*italy and year for ER, year*italy for Δ ER) have been added when the two countries are compared.

4.2. Regression results and analysis General analysis of the impact of the ACE

The equity ratio and the annual variation of the equity ratio, ΔER (= $ER_t - ER_{t-1}$) are analyzed over the years 2009 - 2014. An increase in equity is expected in 2012 with the introduction of the ACE. Tables 3 to 5 present the results of the various regressions, for Italian and Spanish companies selected based on criteria discussed previously.

Table 3 shows regression results for the effect of the introduction of the ACE on corporate equity for 85.310 Italian firms over the observation period 2009-2014. The independent variables are Reform, TotalAssets, Turnover, Profits/Losses, GDPgrowth, Inflation. The regressions cluster entries in the sample by company by adding a fixed-effect on firms. The "fixed effects" refer to model in which data are grouped according to observed factors. In this case, the companies have been grouped by their unique ID. So, each group consisted of six elements, the number of observed years. These six elements correspond to the same company but with data related to various years. The fixed effects help controlling for unchanged characteristics of companies over time, such as the business or the managerial capabilities of a company.

The regression is also made with categorial variable, Year*italy. This numerical variable corresponds to the year multiplied by a dummy variable, Italy, equal to 1 if the SME's headquarter is located in Italy, equal to zero otherwise. It helps controlling for trends over time.

All the regressions performed in Table 3 contain the 85.310 Italian SMEs and control for fixedeffects by firms. The regressions (2) and (4) contain the new variable year*italy. The introduction of Year*italy highlights the positive impact of the ACE on the level of the equity ratio, ER. The effect of the ACE on the equity ratio is estimated to 0,87%. These results are statistically significant with a significance level below 1%.

	(1)	(2)	
Dependent variable	ER	ΔER	
Reform	.0087289***	.0229071***	
	(.0006479)	(.0013208)	
Total Assets		0000996***	
		(1.64e-06)	
Turnover	0000625***	5.62e-06***	
	(9.98e-07)	(1.01e-06)	
Profits/Losses	.0003517***	.0004835***	
	(4.97e-06)	(5.50e-06)	
GDP growth	.0684452***	.3588209***	
	(.0125445)	(.0273906)	
Inflation	.0620545***	.0261439	
	(.0163426)	(.0259906)	
Year*italy	.0009841***	0009423**	
	(.0002609)	(.0004057)	
FE firms	Yes	Yes	
Number firms	85310	85310	

Table 3: Impact of the Italian ACE on the level of equity ratio of SMEs, with time trends control

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels. Total Assets, Turnover & Profits/Losses are computed in thousand EUR

Table 4, shows regression results for the effect of the introduction of the ACE on corporate equity for Italian firms by applying a difference-in-difference (DiD) with the Spanish firms. The sample collects data for 144.619 companies. The regressions (2) and (4) also contain the variables year*Italy and year to control for varying time trends between Spain and Italy (see "Descriptive Statistics").

Since we include the Spanish SMEs, the use of the "interaction" dummy variable Reform*Italy is important to obtain coherent results. This shows the importance of using variables controlling for time trends. Without variables controlling for time trends, results show a negative impact of the ACE on the level of Italian companies' equity ratio (-1,42%), which is incoherent with the goals of the Italian tax reform. After controlling for time trends with the regressions (2) and (4), the ACE is taken responsible for an increase of the equity ratio equivalent to 0,31% and an increase of the variation of the equity ratio up to 1,62%. These results have a statistical significance at 1%. By only considering the Italian companies, the influence of the ACE on the

variation of the equity ratio ΔER is estimated at 2,30%. However, by considering the Italian and the Spanish companies, the impact of the ACE on ΔER is lower, at around 1.62%. This difference shows the importance of comparing the Italian and the Spanish contexts. In this case, the assessed impact of the ACE would be overestimated by 0.68% compared to the results obtained for Italian firms only.

The Difference in Difference method requires to have a control group with vigorously parallel trends, in terms here of ER and Δ ER over the year, outside the year of introduction to ACE, to provide accurate results. It can be easily noticed from Table 2, that the growth of ER varies faster in Spain than in Italy. The figures and their interpretation should then be considered with care. For more accurate results, a new control group should be created with closer similarities with the selected Italian SMEs such that their trends are well parallel.

	(1)	(2)	(3)	(4)
Dependent variable	ER	ER	ΔER	ΔER
Reform*italy	0142282***	.0031103***	.0112563***	.0162183***
-	(.000621)	(.000602)	(.0004686)	(.0007803)
Reform	.0045516***	0020365***	.0066459***	.0029344***
	(.0005812)	(.0005998)	(.0008451)	(.0010433)
Total Assets			0001266***	0001255***
			(1.48e-06)	(1.51e-06)
Turnover	0000589***	0000587***	.0000114***	.0000114***
	(7.68e-07)	(7.67e-07)	(7.90e-07)	(8.04e-07)
Profits/Losses	.0003267***	.0003265***	.0005321***	.0005337***
	(4.04e-06)	(4.05e-06)	(4.58e-06)	(4.60e-06)
GDP growth	099958***	0164422	.2870824***	.2623384***
-	(.0107517)	(.010667)	(.0180194)	(.0191918)
Inflation	.3114949***	.2761752***	.0396928***	.0931719***
	(.0066573)	(.0122239)	(.0116444)	(.0137544)
Year*italy		0060853***		0018483***
-		(.0002341)		(.0002502)
Year		.0040922***		
		(.0002647)		
FE firms	Yes	Yes	Yes	Yes
Number firms	144619	144619	144619	144619

Table 4: impact assessment of the Italian ACE by comparing Italian & Spanish SMEs

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels. Total Assets, Turnover & Profits/Losses are computed in thousand EUR

Influence of the SMEs' initial shareholders' funds on the impact of the ACE

To study the influence of the amount of shareholders' funds, the Italian SMEs have been split into 3 groups:

-	low shareholders' funds	(between 25.000 EUR and 50.000 EUR)
-	medium shareholders' funds	(between 50.000 EUR and 100.000 EUR)
-	high shareholders' funds	(100.000 EUR and above)

The results in Table 5 show that the ACE has a more important impact on the equity ratio of firms with medium and high shareholders' funds in 2009 (respectively 0,95% and 0,90%) compared to firms with lower shareholders' funds (around 0,46%). The results obtained have a statistical significance at 1% for each category of firms.

Results show that firms with higher Shareholders' funds are less impacted by the macroeconomic control variables such as "Inflation" and "GDP growth". One explanation is that smaller companies tend to be more sensitive to the economic situation of the country where than bigger companies and their economic performance makes these companies' leverage more sensitive to macroeconomic variables.

Dependent variable	ER	ER	ER	ER
Shareholders' funds (2009)	all	[25k-50k)	[50k-100k)	[100k)
Reform	.0087289***	.0045758***	.0095424***	.0090993***
	(.0006479)	(.0016442)	(.0013246)	(.0008235)
Turnover	0000625***	0000748***	0000711***	0000614***
	(9.98e-07)	(2.73e-06)	(2.11e-06)	(1.21e-06)
Profits/Losses	.0003517***	.0005693***	.0004828***	.0002812***
	(4.97e-06)	(.0000182)	(.0000128)	(5.51e-06)
GDP growth	.0684452***	.1302603***	.0946051***	.0218088
-	(.0125445)	(.0326934)	(.0261074)	(.0156346)
Inflation	.0620545***	.2933625***	.0763368**	0197037
	(.0163426)	(.041734)	(.0333945)	(.0206901)
Year*italy	.0009841***	.0061835***	.003476***	0019319***
-	(.0002609)	(.0006586)	(.0005324)	.0003315
FE firms	Yes	Yes	Yes	Yes
Number firms	85310	15474	22554	47337

Table 5: Impact of the shareholders' funds on the level of the equity ratio, considering only Italian companies

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels.

Total Assets, Turnover & Profits/Losses are computed in thousand EUR

Even though the ACE has a positive impact on the level of the equity ratio of Italian firms with shareholders' funds lower than 50.000 EUR, the impact is nearly divided by 2 for such companies. This means that the ACE has a reduced impact for the smallest SMEs while these companies would have a bigger need.

Table 6 aims at analyzing the impact of the ACE on the variation of the equity ratio of Italian firms grouped by their shareholders' funds, and compared them with the Spanish companies. The regressions perform again a difference-in-difference and contain the control variables catching time trends. The ACE significantly and positively impacts the variation of the equity ratio (Δ ER) for all categories of companies. However, the companies with shareholders' funds lower than 100.000 EUR faced an increase in Δ ER of respectively 1,16%. Companies with shareholders' funds shareholders' funds superior to 100.000 EUR faced a larger increase in Δ ER (1,94%).

Dependent variable	ΔER	ΔER	ΔER	ΔER
Shareholders' funds (2009)	all	[25k-50k)	[50k-100k)	[100k)
Reform*italy	.0162183***	.0116265***	.0117169***	.0193597***
	(.0007803)	(.002432)	(.001762)	(.0009406)
Reform	.0029344***	.0057672	.0058381**	.0024534**
	(.0010433)	(.0035995)	(.0025271)	(.001183)
Total Assets	0001255***	0001051***	0001128***	0001317***
	(1.51e-06)	(4.50e-06)	(3.26e-06)	(1.81e-06)
Turnover	.0000114***	8.22e-06***	7.21e-06***	.0000119***
	(8.04e-07)	(2.61e-06)	(1.83e-06)	(9.51e-07)
Profits/Losses	.0005337***	.0007387***	.000724***	.0004854***
	(4.60e-06)	(.0000207)	(.0000143)	(4.94e-06)
GDP growth	.2623384***	.2278686***	.2357545***	.2958814***
	(.0191918)	(.0547256)	(.0419637)	(.0228417)
Inflation	.0931719***	0591153	.069029**	.1191984***
	(.0137544)	(.0452985)	(.0321714)	(.0158529)
Year*italy	0018483***	0005213	0013179**	0024287***
	(.0002502)	(.0007631)	(.0005569)	(.0003046)
FE firms	Yes	Yes	Yes	Yes
Number firms	144619	21624	33368	90128

Table 6: Impact of the shareholders' funds on the variation of the equity ratio, comparing Italian and Spanish companies

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels. Total Assets, Turnover & Profits/Losses are computed in thousand EUR

One probable reason for these differences between categories of firms can be due to the difficulty of smaller companies to finance their investment by increasing their equity compared to their debt. SMEs often have difficulties to finance their activities and investment with equity due to several factors such as their size and the risk it implies. The results support the idea that these factors might also occur among SMEs.

Influence of the number of shareholders on the impact of the ACE

The Table 7 aims at analyzing the effect of ownership structure on the impact of the ACE on the level of equity ratio and the variation of the equity ratio. If the number of shareholders does

not influence greatly the ER itself (from 0,77% to 1,05% for 1 to 3 shareholders), Table 7 shows that the variation of equity ratio increases significantly for companies having at least 3 shareholders by 2,63\% instead of 2,1%.

The results obtained here differ from the analysis of the ACE on Austrian SMEs, Petutschnig & Rünger (2017). They observe that a higher number of shareholders implies conflicts of interest among them. This causes the Austrian ACE, "Allowance for Growth and Investment", to be less effective for companies with more shareholders.

Dependent variable	ΔER	ΔER	ΔER	ΔER
Number of shareholders	all	1	2	3&+
Reform	.0229071***	.0207212***	.020957***	.0262971***
	(.0013208)	(.0033337)	(.0018054)	(.002292)
Total Assets	0000996***	0001055***	0001007***	0000951***
	(1.64e-06)	(3.98e-06)	(2.28e-06)	(2.85e-06)
Turnover	5.62e-06***	4.22e-06*	6.17e-06***	6.00e-06***
	(1.01e-06)	(2.53e-06)	(1.38e-06)	(1.77e-06)
Profits/Losses	.0004835***	.0005003***	.0004923***	.0004588***
	(5.50e-06)	(.0000133)	(8.17e-06)	(9.07e-06)
GDP growth	.3588209***	.3244192***	.3476602***	.3715782***
-	(.0273906)	(.0690556)	(.0376498)	(.0465882)
Inflation	.0261439	.0978293	.0451137	0359537
	(.0259906)	(.0671035)	(.0361963)	(.0450247)
Year*italy	0009423**	0018962*	0010812*	0004272
	(.0004057)	(.0010659)	(.0005639)	(.0007103)
FE firms	Yes	Yes	Yes	Yes
Number firms	85310	15755	43422	26454

Table 7: Impact of the ACE on the variation of equity of Italian companies, by number of shareholders

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels.

Geographic disparities with the ACE

The results showed in Table 8 highlight large disparities among regions in Italy. The ACE has a much smaller impact on the level of the equity ratio and on the variation of the equity ratio in *Mezzogiorno*, corresponding to South and Insular Italy. A major concern for the Italian authorities is that the implementation of the ACE appears to have insignificant impact on the level of equity ratio in South and Insular Italy. This can lead to an increase of the already existing inequalities among regions.

Regions group	Name of the group	On the level of ER	On the variation of ER
ITC	Northwest Italy	0.0095446***	0.0311281***
ITH	Northeast Italy	0.0074960***	0.0344873***
ITI	Central Italy	0.0091768***	0.0262950***
ITF	South Italy	0.0019144	0.0185740***
ITG	Insular Italy	-0.0004705	0.0100278**

Table 8: Geographic analysis of the impact of the ACE

***, ** and * indicate the statistical significance at respectively 1%, 5% and 10% levels.

Disparities also occur within the regions. For example, the level of equity of SMEs in *Liguria* increased by 1,53% and in *Lombardia* by "only" 0,9%, even though the two regions are in Northwest Italy.

Since some regions have much lesser SMEs than others, this can bias slightly the geographic analysis.

5. Comparison with the Austrian ACE

Petutschnig and Rünger (2017) performed an analysis of the impact of the ACE on Austrian companies. Even though their studies evaluate the effects on corporate equity and profit distribution in general, some results can be exploited to extrapolate and estimate the impact more specifically on SMEs.

Their analysis puts in evidence that the ACE is responsible for increasing the corporate equity ratio by 3,4%.

When performing a difference-in-difference with Swedish companies, the impact of the Austrian ACE is given by:

Table 9: Effects of the AIE with a difference in difference, 1996-2003¹⁸

Dependent var	riable	ER_t	
Austriat . Ref	orm _t	0.0344*	***
		(0.010	2)

***, ** and * indicate the statistical significance at the 1%, 5% and 10% levels, respectively.

¹⁸ Idem.

Their study also analyzes the impact of the Austrian ACE depending on the size of companies through total assets. To do so, the sample is divided in quartiles.

Dependent variable		ER_t		
Quartile	1	2	3	4
Austriat. Reformt	0.1378***	0.0718***	0.0277***	0.0071
	(0.0517)	(0.0105)	(0.0081)	(0.0091)

Table 10: Effects of the AIE with DiD by quartile, 1996-2003¹⁹

***, ** and * indicate the statistical significance at the 1%, 5% and 10% levels, respectively.

Regression results performed on Austrian companies grouped into quartiles according to the average amount of total assets for the years before the Austrian reform (1996-1999) show the positive effects on equity for companies and the decreasing effect for upper quartiles. The first quartile was considered in this current study as a good representation of Austrian SMEs for the comparison with the Italian SMEs.

Petutschnig and Rünger (2017) study also the influence of the number of shareholders on the effectiveness of the ACE. In opposition with this current paper, they find that the number of shareholders decreases the effect of the tax reform. They find that firms owned by a single shareholder increase on average by 19,1% the equity ratio through the ACE. Companies owned by more shareholders do no significantly increase their equity ratio.

7. Comparison with the Belgian ACE

Results of studies performed on Belgian companies suggest that the ACE in Belgium led to an increase of corporate equity and simultaneously to a decrease of the debt-equity ratio. Aus dem Moore (2014) found "highly significant and robust estimates that correspond to an increase in investment activity by small and medium-sized firms of about 3% in response to the ACE reform". For information, Andries (2017) and Zangari (2014) provided also evidence that multinationals seemed to have rather taken advantages of the notional interests as a tax-planning device.

As previously expressed, the Belgian ACE system is considered as a hard ACE system while the Austrian and Italian ACE system is considered as a soft one. To analyze the impact of the Belgian ACE, French companies are used to perform a difference-in-difference. They find that the Belgian ACE increased by 4,4% the equity ratio of Belgian SMEs. Table 11 summarizes the impact of the ACE depending on the country that implemented an ACE:

¹⁹ Idem.

Country	Austria	stria Belgium Italy		
Dependent variable	ER	ER	ER	
Reform*austria / ACE / Reform*italy	0.0344***	0.044***	0.0031***	
	(0.0102)	(0.004)	(.000602)	
Reform	-0.0034	-	-0.0020***	
	(0.0057)		(.0005998)	
Turnover	NR	-	-0.0001***	
			(7.67e-07)	
Profits/Losses	NR	-	0.0003***	
			(4.05e-06)	
Profitability	-	0.156***	-	
		(0.021)		
Tangibility	-	-0.241***	-	
		(0.010)		
GDP growth	NR	0.005***	-0.0164	
		(0.001)	(.010667)	
Inflation	NR	0.003	0.2762***	
		(0.002)	(.0122239)	
Year*italy	-	-	-0.0061***	
			(.0002341)	
Belgium dummy	-	-0.083***	-	
		(0.005)		
Non-Debt Tax shield	NR	-0.145***	-	
		(0.053)		
Year	NR	-0.029***	.0040922***	
		(0.002)	(.0002647)	
FE firms	Yes	Yes	Yes	
Industry dummy	No	Yes	No	
Number firms	85310	70170	85310	

Table 11: Impact of ACEs	on the	equity ratio	of SMEs by	country
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NP stands for "not reported".

***, ** and * indicate the statistical significance at the 1%, 5% and 10% levels, respectively.

The impact in Belgium is the highest one among the three countries, which is not really surprising as it involves the total equity, contrary to the other countries as Austria and Italy which involve only the growth of equity. What is more surprising is the relatively small impact in Italy, compared to Austria. The ER for Austria in 2009 was 37,59% when in Italy 30,96%. A smaller impact might be explained by companies more generally led by the family which tends to induce a more traditional but less efficient management. Indeed, the average Italian companies are small. Their prevailing family business model limits the use of external equity and debt. As small- and medium-sized businesses, they face difficulties to sustain medium and long-term projects and lack of entrepreneurial culture for external equity financing²⁰.

²⁰ Source : Private Equity Targets, Strategies for Growth, Market Barriers and Policy implications, Francesco Baldi, Editions Springer, 2013

Conclusion

The first part of the study puts in evidence that the tax relief, also called Allowance for Corporate Equity (ACE) has a real positive impact on the increase of equity for the Italian SMEs. Such impact is estimated at 0,87%. The impact is even amplified for SMEs with more than 1 shareholder (e.g. 1,05% on average for SMEs with at least 3 shareholders) and for SMEs located in Northern Italy (e.g. 1,53% on average for SMEs in Liguria). The increase of the equity ratio due to the ACE is only observed in the year of its introduction.

The comparison with Austria and Belgium, countries which also applied an allowance on capital invested, puts in evidence other discrepancies. For the Austrian SMEs, the impact of the ACE was decreasing with the number of shareholders for the Austrian SMEs while in Italy, the study shows opposite trends. This can probably be explained by the prevailing family business model in Italy.

The efficiency of the ACE in Italy might be debatable. Its impact on the growth of the Equity Ratio is much smaller than in Austria, and the average equity ratio level in Italy still remains lower than the majority of other European countries, specifically lower than in Spain, the country used as the control group for the regressions, Austria and Belgium. A comparison with Belgium, where the allowance was applied on the entire book-value of the capital invested, was also made. The Belgian tax policy shows the largest positive impact on the SMEs' equity ratio, estimated to 4,4%.

The current study shows several discrepancies in the impact of the ACE within Italy and when compared to other countries. It would be interesting to investigate the relative importance of each disparity. The impact of a possible introduction of an ACE through the CCCTB at the European level could then be evaluated for the SMEs.